

REPORT
OF THE
CANADIAN ARCTIC EXPEDITION
1913-18

VOLUME VII: CRUSTACEA

PART L: PARASITIC COPEPODA

By CHARLES BRANCH WILSON

SOUTHERN PARTY, 1913-16



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VOLUME VII: CRUSTACEA

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Report on the Parasitic Copepoda collected during the Canadian Arctic Expedition, 1913-18.

By CHARLES BRANCH WILSON, D.Sc., Ph.D.
State Normal School, Westfield, Massachusetts.

While the parasitic copepods collected by Mr. Fritz Johansen during the Canadian Arctic Expedition do not include any forms new to science, they are still of peculiar scientific interest for two reasons. The first of these has already been stated in connection with both the fresh-water copepods and the free swimming marine forms, namely the fact that they were collected in a region hitherto practically unexplored for such crustaceans.

The present author has reported a few species collected by Alaskan and Siberian fishermen and presented to the United States National Museum; but they were nearly all marine forms and included only a few straggling specimens from the Salmonidae that spawn in fresh water.

The present collection supplements these in a very decisive manner and indicates that the genus *Salmincola* is as well represented in the polar as in temperate regions. In fact we are now justified in concluding that these crustacean parasites are as widely distributed as their fish hosts, and wherever the hosts are found we may well expect to discover also the copepods which infest them.

LERNAEOPODIDÆ.

Salmincola gibber (Wilson).

- From mouth of salmon, Port Clarence, Alaska, Station 20 d.
- From tongue and gills of *Salvelinus malma* at Bernard harbour, Dolphin and Union strait, Northwest Territories, Station 41 v.
- From mouth of *Salvelinus malma*, Bernard harbour, Dolphin and Union strait, Northwest Territories, Station 49 p.

Salmincola siscowet (Smith).

- From tips of gill filaments of *Salvelinus malma* at Bernard harbour, Northwest Territories, Station 37 h.
- Same host and locality, but Station 37 v (lake).
- From tips of gill filaments of *Cristiomer namaycush* at Bernard harbour, Northwest Territories, Station 40 f (lake).
- Same host and locality, but Station 40 g.
- Same host and locality, but Station 40 i.
- From tailfin of *Cristiomer namaycush* at Bernard harbour, Northwest Territories, Station 40 o (lake).

Salmincola falculata (Wilson).

- From mouth of *Salvelinus malma* at Bernard harbour, Northwest Territories, Station 37 v (lake).
- Same host and locality, but Station 49 m (Dolphin and Union strait, Northwest Territories).

LERNÆIDÆ.

Hæmobaphes cyclopterina (Müller).

Among fish remains found in the stomach of *Phoca hispida* Schreber, captured at Collinson point, Alaska, Station 27 j. Another specimen was obtained from the gills of *Cottus* (*Myoxocephalus*) *scorpioides* in Hudson strait, Northwest Territories, September, 1897, by the *Diana* Expedition under Messrs. Low and Wakeham, and has been identified by the present author.

HERPYLLOBIIDÆ.

Selioides bolbroei Levinsen.

Cat. No. 1213. On the back of two Polynoids, *Actinoe sarsi* Kinberg, outer part of Bernard harbour, Dolphin and Union strait, in 3 fathoms of water, Station 41, July 20, 1915.

This species was described and figured, but not named, by Dr. R. Horst in 1878, in a paper entitled "Ueber zwei neue Schmarotzerkrebse" published in *Tijdschrift der Nederlandsche Dierkundige Vereeniging*, vol. 4, p. 51-55, pl. III. He had but a single female specimen which was taken from the annelid, *Polynoe rarispina* in the North Sea, and it was ruined before he had completed his examination of it. But the figure of the ventral surface, which he published, leaves no doubt of its identity.

On May 15 of the same year (1878) G. M. R. Levinsen published a paper "Om nogle parasitiske Krebsdyr, der snylte hos Annelider," *Vidensk. Meddel. Natur. Foren.*, Copenhagen, 1877 (1878), p. 351-380; pl. 6, fig. 1-22.

After giving a list of the species previously found upon Annelids, he described a new genus and species, to which he gave the name *Selioides bolbroei*. The specimens were found upon the Annelid *Harmothoe imbricata* (Linnaeus) on the coast of Greenland, and included both sexes, the females with fully developed egg strings. This is identical with the species figured by Horst and with the present specimens, and is especially noteworthy for two reasons. The swimming legs are all uniramous; those of the first and third pairs are widely separated and close to the lateral margins of the cephalothorax, while the third pair have their basal joints fused across the midline. The egg strings are attached to the sides of the genital segment not by their ends, as is the usual mode, but by the centre of one of the lateral margins. In consequence, as much of the egg string projects forward alongside the thorax as backward alongside the abdomen.

Levinsen found upon *Polynoe cirrosæ* Pall. a single specimen of a second species of this same genus, whose egg strings possessed the added peculiarity of each being four-lobed. He did not name this species because he had but a single mutilated specimen. The presence of this genus in North West Canada, here recorded, and the occurrence of another species of the genus in the Antarctic ocean, recorded below, suggest that there are likely to be many other new forms, when the Annelids of these regions become better known.

In view of the increased interest recently shown in the biology of the Arctic and Antarctic regions, and the noteworthy discoveries which have been made, it does not seem out of place to publish a list of the parasitic copepods which have thus far been reported from these regions.

One hundred and forty years ago (1780) Otto Fabricius compiled the first list of this kind, which he called "Fauna Greenlandica," and which, of course, was restricted to the one area mentioned. Fabricius was chaplain at Frederikshaab, Greenland, for six years, and most of the species he mentioned were obtained from Kvanefjord, which is near by. They included one species referred to the old genus *Binoculus*, one *Cyclops* and seven Lernaans. Not one of the entire number is known to-day by the name given to it in Fabricius' list.

Krøyer was the next to present a "Conspectus Crustaceorum Groenlandiae", in the *Naturhistorisk Tidsskrift*, vol. 2, 1838-39, p. 249. This portion did not include any copepods, but the second and third portions published in *Danske Videns. Selskab. Natur. og Math. Afhand.*, vol. 7, 1839, included both free swimming and parasitic forms, but only a few species.

In 1857 H. Rink published in Copenhagen a volume entitled "Grønland geographisk og statistisk beskrevet," to which various authors contributed. The Natural History supplement contained (p. 28-49) a list of Greenland Crustacea, Annelids and Worms by J. Th. Reinhardt.

In 1875 T. R. Jones published in London a similar "Manual of the Natural History, Geology and Physics of Greenland and the Neighbouring Regions." In the Appendix, p. 146-165, appeared a list of the Crustacea of Greenland by Chr. Lütken, which embraced both free swimming and parasitic forms. And finally, in 1913, K. Stephensen presented in the *Meddelelser om Grønland*, vol. 22, a "Conspectus Crustaceorum et Pycnogonidorum Grœlandiæ," which included all that had previously appeared and added many new species.

These publications were concerned with the fauna of a single country which had been studied far more often and in greater detail than any other portion of the polar regions. But there have also been the reports of numerous expeditions sent by the various nations of the world either to the North or the South Polar regions. Great Britain, the United States, Norway, Sweden, Denmark and Germany have all taken part in these polar explorations and each has contributed its quota to our knowledge of their fauna and flora.

And there have been a few reports on collections made by private individuals or by various museums. From all of these the following list has been compiled. Probably it could be augmented by some of the species found in northern Norway and Sweden, if their geographical distribution were sufficiently known. The Kara Sea and the Murman Coast also suggest promising possibilities, but while the Russian author, Birula, has written several papers upon the Decapod Crustacea from those localities and from Spitzbergen, practically no attention at all has been given to the parasitic copepods.

As here given the list includes 28 Lernaepodoida, 20 Monstrilloida, 18 Caligoida, 11 Notodelphyoida and 2 Harpacticoida, all the groups which possess any parasitic forms being represented.

There are also two species which cannot be referred to any of the groups with certainty or even probability.

The name Lernaepodoida has been substituted for the group designated as Lernaoida by Sars in 1901, in accordance with a suggestion made by Rev. T. R. R. Stebbing in his General Catalogue of South African Crustacea, published in the *Annals of the South African Museum*, vol. 6, 1910, p. 561.

The life history of the genus *Lernæa* as given by the present author in *Bulletin U.S. Bureau of Fisheries*, vol. 35, 1917, p. 165-198; pl. 6-15, shows conclusively that this genus and the family Lernaidae belong to the Caligoida. Hence the name cannot be used to designate another of the groups or divisions.

PARASITIC COPEPODS FROM POLAR REGIONS.

COPEPODA LERNAEPODOIDA.

Chondracanthus cornutus (Müller).

Lernæa cornuta, MÜLLER, O. F. "Zoologie Danica Prodrömus," 1776, p. 227.

Chondracanthus cornutus, LÜTKEN, CH. "The Crustacea of Greenland."

T. R. Jones' Manual of Greenland, 1875, Appendix, p. 162.

Found on the gills of various flounders on the coasts of Greenland and Labrador.

Chondracanthus nodosus (Müller).

Lernæa nodosa, FABRICIUS, OTHO. "Fauna Grœnlandica," 1780, p. 341; no. 331.

Chondracanthus nodosus, LÜTKEN, CH. "The Crustacea of Greenland." T. R. Jones' Manual of Greenland, 1875, p. 162.

Found on the gills of *Sebastes norregicus* (Cuv. & Val.), on the Greenland coast.

Chondracanthus radiatus (Müller).

Lernæa radiata, FABRICIUS, OTHO. "Fauna Grœnlandica," 1780, p. 340; no. 330.

Chondracanthus radiatus, LÜTKEN, CH. "The Crustacea of Greenland." T. R. Jones' Manual of Greenland, 1875, p. 162.

Found on the gills of *Coryphanoides rupestris* (Gunner), on the coast of Greenland.

Clavella agilis (Krøyer).

Anchorella agilis, VANHÖFFEN, E. "Crustaceen." Drygalski, Grönland Expedition der Gesellschaft für Erdkunde zu Berlin, 1891-93, 1897, vol. 2, p. 280.

Found on the skin between the fin rays of *Gadus agilis* Reinhardt, on the coast of Greenland.

Clavella canaliculata Wilson.

Clavella canaliculata, WILSON, C. B. "The Lernæopodidæ." Proc. U. S. Nat. Museum, vol. 47, 1915, p. 675; pl. 46, fig. 149-151.

Taken from the pectoral fin of a tomcod, *Microgadus proximus* (Girard), on the coast of Alaska.

Clavella irina Wilson.

Clavella irina, WILSON, C. B. "The Lernæopodidæ." Proc. U. S. Nat. Museum, vol. 47, 1915, p. 685; pl. 49, fig. 177-181.

Found in the gill cavity of *Gadus macrocephalus* Tilesius, from the Alaskan coast.

Clavella perfida Wilson.

Clavella perfida, WILSON, C. B. "The Lernæopodidæ." Proc. U. S. Nat. Museum, vol. 47, 1915, p. 672; pl. 45, fig. 140-143.

Found on the gills of *Theragra chalcogramma* (Pallas), from the coast of Alaska.

Clavella recta Wilson.

Clavella recta, WILSON, C. B. "The Lernæopodidæ." Proc. U. S. Nat. Museum, vol. 47, 1915, p. 684; pl. 50, fig. 183-184.

From the dorsal and caudal fins of *Sebastes melanops* (Girard), on the Alaskan coast.

Clavella stichæi (Krøyer).

Anchorella stichæi, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, ser. 3, vol. 2, 1863, p. 298; pl. 16, fig. 1, a-g.

Anchorella stichæi, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 339.

Obtained from the pectoral fins of *Stichæus punctatus* (Fabricius), on the coast of Greenland.

Clavella uncinata (Müller).

Lernæa uncinata, FABRICIUS, OTHO. "Fauna Grœnlandica," 1780, p. 338; no. 328.

Anchorella uncinata, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, p. 338. 1913.

Found upon the gills of *Gadus ogac* Richardson, and *Gadus callarias* Linnaeus, on the coast of Greenland.

Clavellodes intermedia (Quidor).

Anchorella intermedia, QUIDOR, A. "Sur les Copépodes recueillis par la mission Jean Chareot dans les mers antarctiques." Bull. Mus. d'Hist. Nat., 1906, p. 29; pl. 3, fig. 37-44.

Found in the mouth of a species of *Nothostenia* in the Antarctic ocean.

Clavellodes rugosa (Krøyer).

Anchorella rugosa, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 338.

Found on the gills of *Anarrhichas minor* Olafsen, and *A. lupus* Linnaeus, on the Greenland coast.

Diocus gobinus (Müller).

Lernæa gobina, FABRICIUS, OTHO. "Fauna Grœnlandica," 1780, p. 339; no. 329.

Lernæa (*Chondracanthus*, Cuv.) *gobina*, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, vol. 1, 1835, p. 280; pl. 2, fig. 8; pl. 3, fig. 12, a-d.

Diocus gobinus, STEENSTRUP & LÜTKEN. "Snyltekrebs og Lernæer." Kongl. Danske Vidensk. Selsk. Skrifter, ser. 5, vol. 5, 1861, p. 423; pl. 15, fig. 39, a-d.

Found in the gill cavity and on the under surface of the Greenland sculpin, *Gymnocanthus tricuspis* (Reinhardt), and sufficiently abundant to have received a common name from the local fishermen.

Eubrachiella antarctica (Quidor).

Brachiella antarctica, QUIDOR, A. "Copépodes recueillis par la mission Jean Chareot dans les mers antarctiques." Bull. Mus. d'Hist. Nat., Paris, 1906, p. 30; pl. 3, fig. 45-48.

From the gills of *Dissostichus eleginoides*, an antarctic fish.

Eubrachiella gaini (Quidor).

Brachiella gaini, QUIDOR, A. Deuxième Expédition Antarctique Française. "Copépodes Parasites." Sci. Nat.; Documents scient., 1912, p. 211; pl. 2, fig. 24; pl. 3, fig. 27.

From the gills and gill cavity of a species of *Trematodus*, an antarctic fish.

Lernaeopoda elongata Grant.

Lernæopoda elongata, MIERS, E. J. "On a small collection of Crustacea made by Edward Whymper, Esq., chiefly in the N. Greenland Seas." Jour. Linn. Soc., vol. 15, 1880, p. 71.

Lernæopoda elongata, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 336.

Found attached to the eye of various Greenland sharks.

Lernaeopoda sebastis Krøyer.

Lernæopoda sebastis, KRØYER, H. "Snyltekrebsene." Naturhistorisk

Tidsskrift, ser. 3, vol. 2, 1863, p. 279; pl. 17, fig. 7, a-h.

From the gill cavity of *Sebastes norvegicus* (Cuv. & Val.), from the Greenland coast.

Naobranchia occidentalis Wilson.

Naobranchia occidentalis, WILSON, C. B. "The Lernaeopodidae." Proc. U. S. Nat. Museum, vol. 47, 1915, p. 663; pl. 44, fig. 136-139.

From the gills of *Gadus macrocephalus* Tilesius, from the coast of Alaska.

Parabrachiella rostrata (Krøyer).

Brachiella rostrata, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 338.

From the gills of the halibut, *Hippoglossus hippoglossus* (Linnaeus), on the Greenland coast.

Probrachiella anserina (Wilson).

Brachiella anserina, WILSON, C. B. "Parasitic Copepods of the Pacific Coast." Proc. U. S. Nat. Museum, vol. 35, 1908, p. 467; pl. 78-79.

From the gill cavity of the rockfish, *Sebastes glaucus* (Hilgendorf) taken at Bering island, Siberia.

Salmincola arcturi (Miers).

Lernaeopoda arcturi, MIERS, E. J. "Crustacea." Nares, Narrative of a Voyage to the Polar Sea, 1875-76, Appendix, no. 7, p. 240.

From the gills of *Salmo arcturus* Günther, from the Greenland coast.

Salmincola bicauliculata (Wilson).

Lernaeopoda bicauliculata, WILSON, C. B. "Parasitic Copepods of the Pacific Coast." Proc. U. S. Nat. Museum, vol. 35, 1908, p. 472; pl. 82.

From the gills of the Dolly Varden trout, *Salvelinus malma* (Walbaum), at Bering island, Siberia.

Salmincola carpionis (Krøyer).

Lernaeopoda carpionis, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, vol. 1, 1837, p. 268; pl. 2, fig. 6.

Lernaeopoda carpionis, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 337.

From the mouth and gills of *Salmo carpio* Fabricius, on the Greenland coast.

Salmincola extumescens (Gadl).

Lernaeopoda extumescens, WILSON, C. B. "Parasitic Copepods of the Pacific Coast." Proc. U. S. Nat. Museum, vol. 35, 1908, p. 475.

From the gill cavity of the hump-backed whitefish, *Coregonus nelsonii* Bean, in the Yukon river, Alaska.

Salmincola gibber (Wilson).

Lernaeopoda gibber, WILSON, C. B. "Parasitic Copepods of the Pacific Coast." Proc. U. S. Nat. Museum, vol. 35, 1908, p. 469; pl. 80.

From the gills of the Dolly Varden trout, *Salvelinus malma* (Walbaum), on the coast of Alaska.

Salmincola inermis (Wilson).

Lernaeopoda inermis, WILSON, C. B. "The Lernaeopodidae." Proc. U. S. Nat. Museum, vol. 47, 1915, p. 614; pl. 32, fig. 47-51.

From the gills of the hump-back whitefish, *Coregonus nelsonii* Bean, in the Yukon river, Alaska.

***Salmincola siscowet* (Smith).**

Salmincola siscowet, WILSON, C. B. "The Lernaeopodidae." Proc. U. S. Nat. Museum, vol. 47, 1915, p. 608; pl. 30, fig. 23-29.

Three females belonging to this species were taken from the mouth of *Salvelinus alpinus alipes* (Richardson), at Etah, Greenland, and are now in the United States National Museum, Cat. no. 49767.

***Sphyrion lumpi* (Krøyer).**

Sphyrion lumpi, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 340.

From the fins of the lumpfish, *Cyclopterus lumpus* Linnaeus, on the Greenland coast.

COPEPODA MONSTRILLOIDA.

***Bactropus cystopomati* Gravier.**

Bactropus cystopomati, GRAVIER, C. "Sur un type nouveau de Crustacé parasite d'un Serpulen de l'Antarctique sud-américaine." Bull. du Mus. Hist. Nat., Paris, vol. 18, 1912, p. 67; 1 text figure.

Bactropus cystopomati, GRAVIER, C. Deuxième Expédition Antarctique française. "Crustacés Parasites." Expedition Charcot, p. 55; text figs. 42-52. 1912.

Taken from the abdominal portion of the digestive tube of a new Serpulid Polychaete, *Cystopomatus macintoshii* Gravier, from Petermann island, Antarctic ocean.

***Choniostoma hanseni* Giard & Bonnier.**

Choniostoma hanseni, GIARD, A. & BONNIER, J. "Contributions a l'etude des Epicarides." Bull. Sci. France et Belgique, vol. 25, 1895, p. 479. Found on *Spirontocaris polaris* (Sabine) in the Kara Sea.

Choniostoma hanseni, VANHÖFFEN, E. "Crustaceen." Drygalski, Grönland Expedition der Gesellschaft für Erdkunde zu Berlin, 1891-93, 1897, vol. 2, p. 281.

Found in the gill cavity of two Greenland shrimps, *Spirontocaris gaimardii* (H. M. Edwards) and *Sp. polaris* (Sabine).

***Choniostoma mirabile* Hansen.**

Choniostoma mirabile, HANSEN, H. J. "Oversigt over de paa Djimphna Togtet indsamlede Krebsdyr." Djimphna-Togtets zoolog.-bot. Udbytte, 1886, p. 271; pl. 24, fig. 7 a-h.

Choniostoma mirabile, GIARD, A. & BONNIER, J. "Contributions a l'Etude des Epicarides." Bull. Sci. France et Belgique, vol. 25, 1895, p. 479.

Found in the gill cavity of the shrimp, *Spirontocaris gaimardii* (H. M. Edwards), in the Kara sea.

***Crypsidomus terebellæ* Levinsen.**

Crypsidomus terebellæ, LEVINSEN, G. M. R. "Om nogle parasitiske Krebsdyr, der snylte hos Annelider." Vidensk. Meddel. Naturh. Kjøbenhavn, 1878, p. 375; pl. 6, fig. 19-20.

Found on the Annelid *Thelepus cincinnatus* Fabricius, on the coast of Greenland.

The name *Crypsidomus* was used by Günther for a genus of reptiles in 1864, and by Ausserer for a genus of arachnids in 1871, both of which are prior to the

appearance of Levinsen's paper in 1878. Hence it cannot stand for a copepod genus, and in its place is suggested the name *Aphanodomus*, from *Ἀφανος* hidden and *δῶμα* house, meaning dwelling in secret places, and thus having the same significance as *Cryptidomus*.

Eurysileniopsis sarsi Gravier.

Thylacoides sarsi, GRAVIER, CH. "Sur un nouveau genre Crustacé parasite d'un Syllidien de l'Antarctique sud-américaine (*Thylacoides*, nov. g., *sarsi*, nov. sp.)." Bull. Mus. d'Hist. Nat., Paris, 1912, p. 71, 2 text figs.

Eurysileniopsis sarsi, GRAVIER, CH. Deuxième Expédition Antarctique Française. "Crustacés Parasites." Sci. Nat.; Documents scient., 1912, p. 51; text figs. 33-41.

Found on the back of *Trypanosyllis gigantea* (MacIntosh), an antarctic annelid.

Eurysilenium oblongum Hansen.

Eurysilenium oblongum, HANSEN, H. J. "Oversigt over de paa Djimphua Togtet indsamlede Krebsdyr." Djimphua-Togtets zool.-botan. Udbytte, 1886, p. 82 (264); pl. 24, fig. 1-10.

Found on the annelid *Harmothoe badia* Theel, from the Kara sea.

Herpyllobius affinis Hansen.

Herpyllobius affinis, HANSEN, H. J. "Oversigt over de paa Djimphua Togtet indsamlede Krebsdyr." Djimphua-Togtets zool.-bot. Udbytte, 1886, p. 81 (263); pl. 24, fig. 2.

Herpyllobius affinis, GIARD, A. & BONNIER, J. "Contributions à l'Étude des Epicarides." Bull. Sci. France et Belgique, vol. 25, 1895, p. 480. Found on *Harmothoe badia* Theel, an annelid from the Kara sea.

Herpyllobius arcticus Steenstrup & Lütken.

En ny . . . Lernaea, KRØYER, H. "Grønlands Amphipoder." Kongl. Danske Vidensk. Selsk. math.-naturvid. Afhand., vol. 7, 1838, p. 321; no. 58.

Silenium polynoës, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, ser. 3, vol. 2, p. 403; pl. 18, fig. 6, a-g. 1863.

Herpyllobius arcticus, STEENSTRUP, J. & LÜTKEN, CH. "Snyltekrebs og Lernæer." Kongl. Danske Vidensk. Selsk. Skrifter, ser. 5, vol. 5, 1861, p. 426; pl. 15, fig. 40.

Herpyllobius arcticus, LEVINSEN, G. M. R. "Om nogle parasitiske Krebsdyr, der snylte hos Annelider." Vidensk. Meddel. Naturh. Foren., Kjøbenhavn, 1878, p. 363; pl. 6, fig. 12-18.

Herpyllobius arcticus, JENSEN, S. "Nogle Oplysninger om . . . Herpyllobius arcticus." Oversigt Kongl. Danske Vidensk. Selsk. Forhandl. 1900, p. 84; pl. 1, fig. 8-9; pl. 2, fig. 12-18.

Herpyllobius arcticus, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 343.

Found on the outside surface of *Harmothoe imbricata* (Linnaeus), *Harmothoe spinosa* Kinberg, *Harmothoe gourdoni* Gravier, *Enipo rhombigera* Ehlers, *Polynoe cirrata* Fabricius, *Polynoe scabra* Oersted, *Nychia amondseni* Malmgren, arctic annelids found in the Kara sea and on the Greenland coast.

Saccopsis terebellidis Levinsen.

Saccopsis terebellidis, LEVINSEN, G. M. R. "Om nogle parasitiske Krebsdyr, der snylte hos Annelider." Vidensk. Meddel. Naturh. Foren., Kjøbenhavn, 1878, p. 374; pl. 6, fig. 21-22.

Saccopsis terebellidis, GIARD, A. & BONNIER, J. "Contributions à l'Etude des Epicarides." Bull. Sci. France et Belgique, vol. 25, 1895, p. 481.

Saccopsis terebellidis, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 343.

Saccopsis terebellidis, STEPHENSEN, K. "Zoogeographical Investigation in Southern Greenland." Meddel. om Grønland, vol. 53, 1916, p. 305.

Found on *Terebellides stroemii* Sars and *Leucariste arcticus* Sars, Greenland annelids.

Selioides bolbroei Levinsen.

Selioides bolbroei, LEVINSEN, G. M. R. "Om nogle parasitiske Krebsdyr, der snylte hos Annelider." Vidensk. Meddel. Naturh. Foren., Kjøbenhavn, vol. 31, 1878, p. 353; pl. 6, fig. 5-11.

From the outer surface of *Harmothoe imbricata* (Linnaeus), a Greenland annelid.

Selioides tardus Gravier.

Selioides tardus, GRAVIER, CH. Deuxième Expédition Antaretique Française. "Crustacés Parasites." Sci. Nat.; Documents scient., 1912, p. 43; text figs. 19-32.

From the outside surface of *Hermadion rouchi* Gravier, an antarctic annelid.

Sphæronella acanthozonis Hansen.

Sphæronella acanthozonis, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 141; pl. 7, fig. 5, a-d.

In the marsupium of *Acanthozone cuspidata* (Lepech) from the Kara sea.

Sphæronella argissæ Hansen.

Sphæronella argissæ, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 123; pl. 4, fig. 3, a-n.

From the marsupium of *Argissa typica* Boeck, a Greenland amphipod.

Sphæronella bonnierii Hansen.

Sphæronella bonnierii, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 136; pl. 6, fig. 4; pl. 7, fig. 1.

From the marsupium of *Protomedea fasciata* Krøyer, a Greenland amphipod.

Sphæronella curtipes Hansen.

Sphæronella curtipes, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 164; pl. 10, fig. 2, a-g.

From the marsupium of *Janira spinosa* Harger, a Greenland isopod.

Sphæronella decorata Hansen.

Sphæronella decorata, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 150; pl. 8, fig. 3; pl. 9, fig. 1.

From the marsupium of *Diastylis rathkei* (Krøyer), a Greenland cumacean.

Sphæronella holboelli Hansen.

Sphæronella holboelli, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 127; pl. 5, fig. 2, a-g.

From the marsupium of *Paramphithoe boeckii* Hansen, a Greenland amphipod.

Sphæronella metopæ Hansen.

Sphæronella metopæ, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 125; pl. 4, fig. 4; pl. 5, fig. 1.

From the marsupium of *Metopa bruzelii* (Goës), a Greenland amphipod.

Sphaeronella munnopsidis Hansen.

Sphaeronella munnopsidis, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 168; pl. 10, fig. 4, *a-d*.

Found in the marsupium of *Munnopsis typica* M. Sars, a crustacean living in the Kara sea.

Stenothocheres egregius Hansen.

Stenothocheres egregius, HANSEN, H. J. "The Choniostomatidae." Copenhagen, 1897, p. 89; pl. 1, fig. 1, *a-l*.

From the marsupium of *Metopa borealis* G. O. Sars, and *Metopa brazili* (Goës), Greenland amphipods.

COPEPODA CALIGOIDA.

Caligus curtus Müller.

Torskeluus, STRÖM, HANS. "Physisk og Oeconomisk Berkrivelse." Copenhagen, 1762, p. 167; pl. 1, figs. 4-6.

Binoculus piscinus oculis marginalibus, FABRICIUS, OTHO. "Fauna Groenlandica," Hafniae et Lipsiae, 1780, p. 264; No. 239.

Found on the cod and haddock along the Greenland coast and known among the fishermen by the name bestowed upon it by Ström, "Torskeluus".

Dinematura ferox Krøyer.

Dinematura ferox, MIERS, E. J. On a "small Collection of Crustacea made by Edward Whymper, Esq., chiefly in the N. Greenland Seas." Jour. Linn. Soc., vol. 15, p. 71. 1881.

From the shark, *Somniosus microcephalus* (Bloch), at Umanak, Greenland, usually attached to the eye of the fish.

Echthrogaleus coleoptratus (Guerin).

Echthrogaleus coleoptratus, WILSON, C. B. "The Pandaridae and Cecropinae." Proc. U. S. Nat. Museum, vol. 33, p. 367.

Found on an unidentified shark captured near Unalaska, Alaska.

Hæmobaphes cyclopterina (Müller).

Lernæa cyclopterina, FABRICIUS, OTHO. "Fauna Groenlandica", 1780, p. 337; No. 326.

Found on the gills of the following arctic fish, *Cyclopterus spinosus* Müller, *Myoxocephalus groenlandicus* (Cuvier & Valenciennes), *Myoxocephalus bubalis* (Euphrasen), *Pholis fasciatus* (Bloch & Schneider), *Sebastes marinus* (Linnaeus), *Merluccius merluccius* (Linnaeus).

Hatschekia hippoglossi (Krøyer).

Clavella hippoglossi, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 341.

From the gills of a species of *Hippoglossus* on the Greenland coast.

Lepeophtheirus hippoglossi (Krøyer).

Binoculus piscinus, FABRICIUS, OTHO. "Fauna Groenlandica", 1780, p. 264; No. 239.

Caligus hippoglossi, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, vol. 2, 1837, p. 625; pl. 6, fig. 3.

Lepeophtheirus parviventris Wilson.

Lepeophtheirus parviventris, WILSON, C. B. "The Caliginae." Proc. U. S. Nat. Museum, vol. 28, 1905, p. 635; pl. 23, fig. 275-284.

On the gills of *Gadus macrocephalus* Tilesius, from Alaska.

Lepeophtheirus robustus Krøyer.

Lepeophtheirus robustus, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, ser. 3, vol. 2, 1863, p. 135; pl. 6, fig. 6, *a-c*.

Found on the gills of various rays from the Greenland coast.

Lepeophtheirus salmonis Krøyer.

Lepeophtheirus salmonis, WILSON, C. B. "Pacific Coast Copepods." Proc. U. S. Nat. Museum, vol. 35, 1908, p. 440.

From the outer skin of the hump-backed salmon, *Oncorhynchus gorbuscha*, and the Dolly Varden trout, *Salvelinus malma*, at Karluk, Alaska.

Lernæocera branchialis (Linnaeus).

Lernæa gadina, FABRICIUS, OTTO. "Fauna Groenlandica", 1780, p. 336; No. 325.

Lernæa branchialis, STEPHENSEN, K. "Grønlands Krebsdyr." Meddel. om Grønland, vol. 22, 1913, p. 348.

Found on the gills of various Gadidae from the Greenland coast.

Lernæocera godfroyi (Quidor).

Lernæa godfroyi, QUIDOR, A. Deuxième Expédition Antaretique Française. "Copepodes parasites." Sci. Nat.; Documents scient., 1912, p. 210; pl. 2, fig. 23.

From the gills of *Cottoperca dolloi* (?), at Tuesday bay, Antaretic ocean.

Nesippus borealis Steenstrup & Lütken.

Nogagus borealis, STEENSTRUP, J. & LÜTKEN, CH. "Snyltekrebs og Lernæer." Kongl. Danske Vidensk. Selsk. Skrifter, ser. 5; vol. 5, 1861, p. 387; pl. 11, fig. 21.

Nesippus borealis, WILSON, C. B. "The Pandarina and Cceropina." Proc. U. S. Nat. Museum, vol. 33, 1907, p. 438; pl. 37.

From the coast of Alaska, host unknown.

Peniculus clavatus (Müller).

Peniculus clavatus, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, ser. 3, vol. 2, 1863, p. 266; pl. 14, fig. 8, *a-g*.

From the fins of *Sebastes norregicus* (Cuv. & Val.), on the Greenland coast.

Pennella antarctica Quidor.

Pennella antarctica, QUIDOR, A. Deuxième Expédition Antaretique Française. "Copepodes Parasites." Sci. Nat.; Documents scient., 1912, p. 206; pl. 1, fig. 15-17; pl. 4, fig. 29-34.

From the skin and blubber of whales belonging to the genera *Balaenoptera* and *Megaptera*, in the antaretic ocean.

Pennella balænopterae Koren & Danielssen.

Pennella balænopterae, QUIDOR, A. Deuxième Expédition Antaretique Française. "Copepodes Parasites." Sci. Nat.; Documents scient., 1912, p. 205; pl. 1, fig. 14; pl. 4, fig. 32.

From the skin of *Balænoptera sibbaldi*, in the antaretic ocean.

Pennella charcoti Quidor.

Pennella charcoti, QUIDOR, A. Deuxième Expédition Antaretique Française. "Copepodes Parasites." Sci. Nat.; Documents scient., 1912, p. 207; pl. 1, fig. 13; pl. 2, fig. 25; pl. 4, fig. 33.

Found on the skin of a species of *Balænoptera* in the antaretic ocean.

Pennella Houvilliei Quidor.

Pennella houvilliei, QUIDOR, A. Deuxième Expédition Antaretique Française. "Copepodes Parasites." Sci. Nat.; Documents scient., p. 209; pl. 1, fig. 1; pl. 2, fig. 26; pl. 3, fig. 28; pl. 4, fig. 37.
From the skin and flesh of a species of *Ereocetus*, in the antarctic ocean.

Sarcotretes scopeli Jungersen.

Sarcotretes scopeli, JUNGENSEN, H. "On a new Gymnoblasic Hydroid (*Ichthyocodium sarcotretis*) epizoic on a new Parasitic Copepod (*Sarcotretes scopeli*) infesting *Scopelus glacialis* Reinhardt." Vidensk. Meddel. Naturh. Foren., Kjøbenhavn, vol. 64, 1911, p. 1; pl. 1, fig. 1-27.
Found burrowing in the flesh of *Scopelus glacialis* on the Greenland coast.

COPEPODA NOTODELPHYOIDA.

Buprorus loveni Thorell.

Buprorus loveni, AURIVILLIUS, C. W. S. "Bidrag till Kännedomen om Krustaceer som lefva hos Mollusker och Tunikater." Akademisk Afhandling som med tillstånd af vidtberömda filosofiska Facultetens i Upsala, matemat.-natur. sektion, Stockholm, 1883, p. 33; pl. 1, fig. 13. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., vol. 4, 1885, p. 236.
On *Phallusia mentula* Müller and *Ascidia obliqua* Alder, arctic tunicates from Lapland.

Doropygus arcticus Aurivillius.

Doropygus arcticus, AURIVILLIUS, C. W. S. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., vol. 4, 1885, p. 233; pl. 8, fig. 1-11.
Found in the branchial sac of *Chelysoma macleanum* Sow. et Brod., an arctic tunicate.

Doropygus demissus Aurivillius.

Doropygus demissus, AURIVILLIUS, C. W. S. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., vol. 4, 1885, p. 230; pl. 7, fig. 14-24.
Found in the branchial sac of *Cynthia echinata* Linn. an arctic tunicate.

Doropygus gibber Thorell.

Doropygus gibber, THORELL, M. T. "Krustaceer som lefva i arter af Släktet *Ascidia*, Linn." Kongl. Svensk. Vetensk. Handl., vol. 3, 1859, no. 8, p. 52; pl. 8, fig. 11.
Found in a species of *Phallusia*, an arctic ascidian.

Enteropsis dubius Schimkewitsch.

Enteropsis dubius, SCHIMKEWITSCH, W. M. "Embryogénie des Copépodes" (Russian). Trav. Soc. Nat. St. Petersbourg, vol. 20, 1889, p. 2, p. 75; pls. 3-5.
Found in *Molgula groenlandica*, an arctic ascidian.

Ent. sis sphinx Aurivillius.

Enteropsis sphinx, AURIVILLIUS, C. W. S. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., vol. 4, 1885, p. 233; pl. 8, fig. 1-11.
Found in the branchial sac of *Molgula ampuloides* Beneden, an arctic ascidian.

Haligryps aculeatus Aurivillius.

Haligryps aculeatus, AURIVILLIUS, C. W. S. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., vol. 4, 1885, p. 244; pl. 9, fig. 11-20.

Found in the branchial sac of *Molgula ampulloides* Beneden, an arctic ascidian.

Haligryps teres Aurivillius.

Haligryps teres, AURIVILLIUS, C. W. S. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., vol. 4, 1885, p. 243; pl. 9, fig. 1-10.

Found in the gall bladder of *Molgula ampulloides* Beneden, an arctic ascidian.

Notodelphys agilis Thorell.

Notodelphys agilis, AURIVILLIUS, C. W. S. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., vol. 4, 1885, p. 230.

From the branchial sac of *Phallusia mentula* Müller on the north coast of Finland.

Schizoproctus inflatus Aurivillius.

Schizoproctus inflatus, AURIVILLIUS, C. W. S. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., vol. 4, 1885, p. 248; pl. 9, fig. 21-32.

From the branchial sac of a species of *Phallusia* from the arctic ocean.

Zanclopus antarcticus Gravier.

Zanclopus antarcticus, GRAVIER, CH. Deuxième Expédition Antarctique Française. "Crustacés Parasites." Sci. Nat.; Documents scient., 1912, p. 68; text figs. 53-62.

On *Cephalodiscus anderssoni* Gravier, an antarctic ascidian.

COPEPODA HARPACTICOIDA.

Canthocamptus hippolytes Krøyer.

Canthocamptus hippolytes, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, ser. 3, vol. 2, p. 334; pl. 17, fig. 9.

Found on the gills of a Greenland shrimp which Krøyer called *Hippolyte aculeata*, but which Stephensen afterward changed to *Spirontocaris groenlandica*. This parasite cannot be located definitely. If it is really a *Canthocamptus* it belongs in the Harpacticoida, but even Krøyer himself placed a question mark after the genus name.

Idyæa furcata (Baird).

Idya furcata, AURIVILLIUS, C. W. S. "Krustaceer hos arktiska Tunikater." Vega-Expeditionen Vetensk. Iakttag., 1885, vol. 4, p. 229.

Idya furcata, VANHÖFFEN, E. "Crustaceen aus dem Kleinen Karajakfjord in W.-Groenland." Zool. Jahrb., Abth. f. Syst., vol. 25, 1907, p. 507; pl. 20-22.

Found in *Molgula ampulloides* Beneden, an arctic tunicate.

COPEPODA OF UNCERTAIN POSITION.

Psilomallus hippolytes Krøyer.

Psilomallus hippolytes, KRØYER, H. "Snyltekrebsene." Naturhistorisk Tidsskrift, ser. 3, vol. 2, 1863, p. 336; pl. 17, fig. 10.

From a crustacean called by Krøyer *Hippolyte aculeata* (O. Fabricius), and by Stephensen (1913) *Spirontocaris groenlandica* (J. C. Fabricius), on the Greenland coast.

With the meager description and the single figure given by Krøyer it is impossible to locate this species anywhere with certainty. It is even doubtful whether it is a true copepod.

Tanypleurus alicornis Steenstrup & Lütken.

Tanypleurus alicornis, STEENSTRUP, J. & LÜTKEN, CH. "Snyltekrebs og Lernæcer." Kongl. Danske Vidensk. Selsk. Skrifter, ser. 5, vol. 5, 1861, p. 425; pl. 15, fig. 38.

From the gills of *Cyclopterus spinosus* Müller, and the mouth of *Somniosus microcephalus* (Bloch), Greenland sharks.

This species was not definitely located by Steenstrup & Lütken, but Bassett-Smith in 1899 placed it in the Chondracanthidae. It cannot possibly belong there if the original description is correct, for its attachment apparatus consists of two stalks or arms, separate or fused, joined at the tips with a cirrhone bulla. If these arms correspond to the second maxillae the species must belong to the Lernaeopodidae, but until this can be determined we must leave it unlocated.

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